

REMARKS/ARGUMENTS

Claims 1-8, 11-13, 17-19, 21 and 26 remain in this application. No claims have been canceled, added or amended.

Rejection under 35 CFR §112

Claim 21 stands rejected under 35 CFR §112, first paragraph, for failing to comply with enablement. This rejection is being traversed. Applicants wish to point out that an exemplary "phenyl-ethynyl-substituted phenyl-ethynyl-phenyl linkage including at least one nitro group" is shown in Example 7 as depicted and described on page 22 of the specification. Withdrawal of the rejection of claim 21 is therefore respectfully requested.

Rejection under 35 CFR §103

The rejection of claims 1-8, 11-13, 17-19, 21 and 26 under 35 U.S.C. §103(a) as being unpatentable over Eguchi et al. (U.S. Patent No. 4,939,556) in view of Ogawa et al. (U.S. Patent No. 5,338,579), Deviney et al. (U.S. Patent No. 5,644,006), and Fukami et al. (U.S. Patent No. 5,914,208) is hereby traversed and reconsideration thereof is respectfully requested in view of the remarks set forth below.

Claim 1 recites an electronic device with at least two contacts; and a monolayer of conductive organic material forming a conductive path between the contacts. The conductive path includes alternating ethynyl and aryl groups with at least one phenyl-ethynyl linkage, and at least one nitro electron withdrawing group.

Claim 21 recites an electronic device with two contacts, wherein at least one contact is a palladium contact; and a self-assembled monolayer of a conductive organic molecule comprising a phenyl-ethynyl-substituted phenyl-ethynyl-phenyl linkage between the contacts, wherein the substituted phenyl includes at least one nitro group, and wherein the organic molecule is bonded to the palladium contact by at least one isocyano group on a terminal phenyl of the linkage.

The Eguchi reference discloses a semiconductor device with a conductive organic film and electrodes. Eguchi discloses that " *In order to form a conductive monomolecular film, [the molecules] are required to have further as an electroconductive part in combination, for example, tetracyanoquinodimethane (TCNQ), derivatives thereof, or analogues thereof, for example, 11,11,12,12-tetracyano-2,6-naphthoquinodimethane (TMAP); or tetrathiafulvalene (TTF) or derivatives thereof; or, further, tetrathiatetracene (TTT) or analogues thereof.*" However, Eguchi discloses neither alternating ethynyl and aryl groups with, nor at least one nitro electron withdrawing group, as recited in claims 1 and 21.

There is no prima facie case of obviousness on the basis of the cited references because there is no motivation to combine these references. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. (See MPEP 2143.01)

In the present case there is simply no teaching or suggestion to modify the cited references to produce the invention claimed in the instant application. Specifically, while Eguchi discloses conductive compounds (analogues of TCNQ, TMAP, TTT, or TTF containing hydrophobic alkyl chains), the teachings of Ogawa or Deviney have nothing to do with conductive polymer films. Furthermore, without relying on Ogawa and Deviney, the remaining references are not sufficient to support a prima facie case of obviousness.

Ogawa discloses manufacturing a chemically adsorbed film, preferably represented by $\text{CF}_3(\text{CF}_2)_n(\text{R})_m\text{SiX}_p\text{Cl}_{3-p}$, that can repel water and oil. (See Ogawa: Abstract, and col 2 lines 53-54) The conductive compounds disclosed by Eguchi are structurally and functionally unrelated to the compounds disclosed by Ogawa. There is nothing within Eguchi, Ogawa, or in the general knowledge available to one of ordinary skill in the art which teaches or suggests that the two references may be combined.

Nonetheless, the Office Action proceeded to modify Eguchi with Ogawa. The Office Action stated that "What is not shown in Eguchi ... is the alternating ethynyl and aryl groups recited in claim 1. Ogawa ... discloses the teaching of substituting the alkyl group for the ethynyl

group/ aryl group". Applicants can only assume that Office Action is suggesting that Ogawa teaches or suggests that the alkyl group in Eguchi's compound can be substituted by ethynyl group/aryl group. However, there is absolutely no basis for the Office Action's position. The alkyl group which Ogawa teaches can be substituted by an ethynyl group/phenyl group is the alkyl group present in the polymer Ogawa teaches, and not the alkyl groups in Eguchi's compounds. Since Eguchi's compounds and Ogawa's compounds are structurally and functionally different, there is no teaching or suggestion in either reference that would motivate one of ordinary skill in the arts to modify Eguchi's compounds with the substituents taught by Ogawa. As such, combining Eguchi with Ogawa would be improper, and thus cannot be a basis for establishing a prima facie case of obviousness against neither claim 1 nor claim 21.

Applicants further point out that even if the alkyl groups in Eguchi are replaced by alternating ethynyl groups/phenyl groups of Ogawa, the resulting compound is incomparably different from the compound in claim 21. The result of modifying Eguchi's compound with Ogawa's alternating ethynyl or phenyl groups is a *TCNQ*, *TMAP*, *TTT*, or *TTF* analog containing a chain composed of alternating ethynyl or phenyl groups. The conductive compound of instant claim 21 does not have a TCNQ, TMAP, TTT, or TTF moiety. As such, even if Eguchi is modified by Ogawa, the resulting compound is structurally different from the conductive compound claimed in claim 21. Thus, even the combination of the references cannot support a prima facie case of obviousness against claim 21.

Furthermore, Applicants point out that even if the references are combined the fact that references can be combined or modified is not sufficient to establish prima facie obviousness. (See MPEP 2143.01) The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). In this case there is nothing in the cited references that suggests that the combination is desirable.

Quite the opposite, modifying Eguchi's compounds by replacing the alkyl groups therein with ethynyl or phenyl groups could quite possibly adversely affect the operation of Eguchi's compounds. Applicants remind the Examiner that the proposed modification cannot render the prior art unsatisfactory for its intended purpose. (See MPEP 2143.01) In this case the alkyl groups in Eguchi's compounds serve the important function of producing an amphiphilic

compound, i.e., a compound which has both a hydrophobic and hydrophilic character. This amphiphicity is essential to forming layered films in water. Substituting polar groups such as ethynyl and nitro substituted phenyl groups for these hydrophilic alkyl groups could not only disrupt the amphiphilic nature of the compounds, but it could also interfere in the charge transfer properties of the *TCNQ*, *TMAP*, *TTT*, or *TTF* moieties, thereby rendering them unsatisfactory for their intended purpose.

Combining the teachings of Deviney with that of Eguchi and Ogawa is improper under MPEP 2143.01. The combination is improper because there is no teaching or suggestion in Eguchi, Ogawa, and Deviney to combine the references in an attempt to reach the instantly claimed invention. Applicants have already pointed out above that it is improper to combine Eguchi and Ogawa. Similarly, it would be improper to combine Deviney with Eguchi and Ogawa because Deviney does not concern conductive polymers. Rather Deviney discloses polymer films consisting of thermoset copolymers for high performance, high temperature applications. (See Deviney first sentence of Abstract). Since the compounds of Deviney are structurally and functionally different from the compounds disclosed by either Eguchi or Ogawa, Applicants maintain that one of ordinary skill in that would not have had a motivation to combine the teachings. As such, the combination is improper and cannot support a case of prima facie obviousness against neither claim 1 nor claim 21.

Nonetheless, the Office Action proceeded to modify Eguchi and Ogawa with Deviney. The Office Action stated that "Deviney ... discloses the teaching of substituting the ethynyl group for the phenyl-ethynyl group...including nitro group N". Applicants can only assume that Office Action is suggesting that Deviney teaches or suggests that the ethynyl group which resulted from Ogawa's modification of Eguchi can be replaced by a nitro substituted phenyl-ethynyl group. However, there is absolutely no basis for the Office Action's position. Applicants strongly assert that the ethynyl group which Deviney teaches can be substituted by a phenyl-ethynyl group is the ethynyl group present in Deviney's compound, and not the ethynyl group the Office Action imported into Eguchi's compound from Ogawa. As such, any attempt to combine these references is not only void scientifically, but it also represents an improper combination of references under MPEP 2143.01.

Applicants further point out that even if the ethynyl groups in Eguchi, which resulted from the replacement of the alkyl group in the original Eguchi compound by the ethynyl/phenyl group of Ogawa, were replaced by a phenyl-ethynyl group from Deviney, the resulting compound is incomparably different from the compound in the presently claimed invention. The result of modifying Eguchi's compound with Ogawa's alternating ethynyl or phenyl groups, and Deviney's phenylethynyl is a *TCNQ*, *TMAP*, *TTT*, or *TTF* analog containing a hydrophobic chain composed of alternating ethynyl and phenyl groups and nitro substituted phenyl-ethynyl groups. The conductive organic compound in claim 21 does not have *TCNQ*, *TMAP*, *TTT*, or *TTF* moieties. As such, even the combination of Eguchi, Ogawa, and Deviney is insufficient to support a prima facie case of obviousness against the presently claimed invention.

Applicants submit that, in view of the fundamental flaws in the Office Action's arguments highlighted above, the combination of the remaining references, i.e., Jeong and Fukami do not ameliorate these flaws, and thus do not further the cause to support a prima facie case of obviousness against the instant claim 1 or 21. Both references deal with compounds that are structurally and functionally different from the compound disclosed by Eguchi, Ogawa or Deviney. As such, there is no teaching or suggestion that would motivate one of ordinary skill in the art to combine the references to reach claim 1 or claim 21. Moreover, when Jeong and Fukami teach of replacing certain functional groups, the replacements are in the compounds which they themselves disclose, and not as the Office Action would have it on Eguchi compound which has been modified by Ogawa, and subsequently modified by Deviney. In any case, since all of the modifications on Eguchi's compound by Jeong, Fukami, Deviney, and Ogawa results in a compound having a *TCNQ*, *TMAP*, *TTT*, or *TTF* moiety, and the compounds of claim 1 and 21 do not include these moieties, the Office Action fails to establish a prima facie case of obviousness against these claims, and claims dependent thereon.

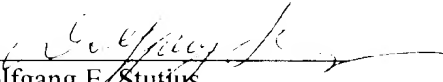
Accordingly, Applicants respectfully request that the rejection of claims 1 and 21 be withdrawn. Claims 2-8, 11-13, 17-19 and 26 depend from claim 1 and should therefore be patentable for the same reasons that claim 1 is patentable.

Applicants respectfully request that the Examiner reconsider and withdraw all outstanding rejections and objections. Favorable consideration and allowance are earnestly solicited. Should there be any questions after reviewing this paper, the Examiner is invited to contact the undersigned at 617-951-7000 (direct dial: 617-951-7681).

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 18-1945, under Order No. YU-P06-002 from which the undersigned is authorized to draw.

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Respectfully submitted,

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